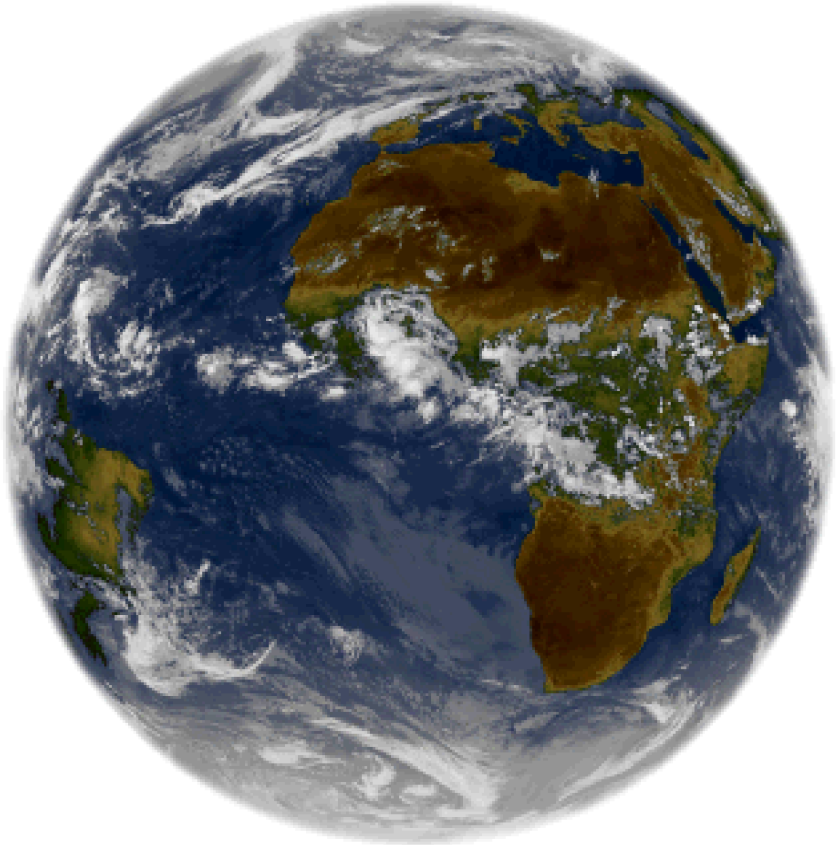
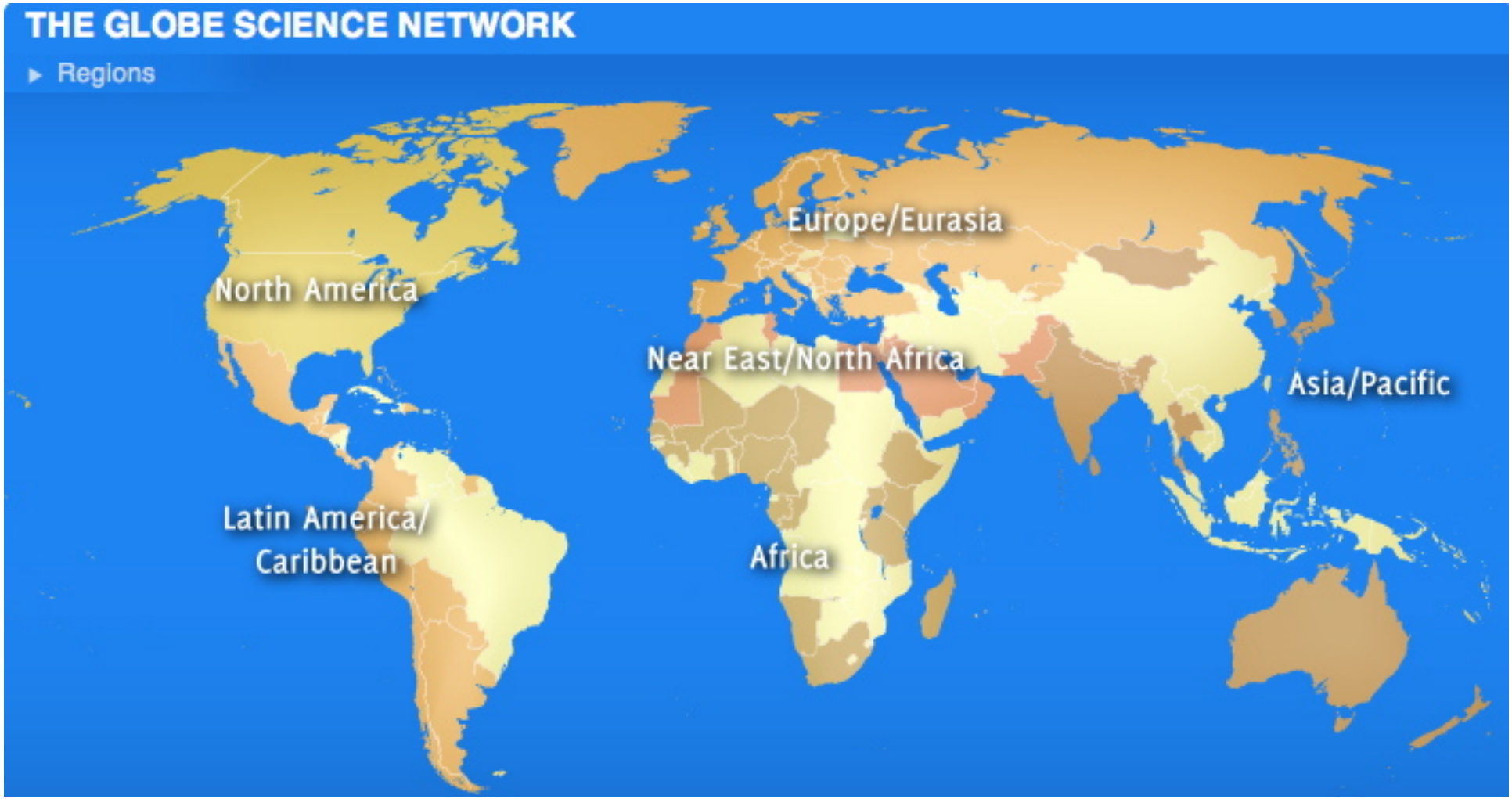
Engaging Students in Understanding Earth System Processes



The GLOBE Program



111 GLOBE Countries

~ 40,000 GLOBE teachers

~ 20,000 schools worldwide

The GLOBE Program

Essential Elements of GLOBE

GLOBE brings together an international community of STUDENTS, TEACHERS and SCIENTISTS to:

- Support improved student achievement in science and mathematics.
- Enhance environmental awareness of individuals throughout the world.
- Contribute to scientific understanding of the Earth.

GLOBE Students Study Earth System Science…

…by gaining a better understanding of its components…

Phenology

Soil Studies

Hydrology

Land Cover

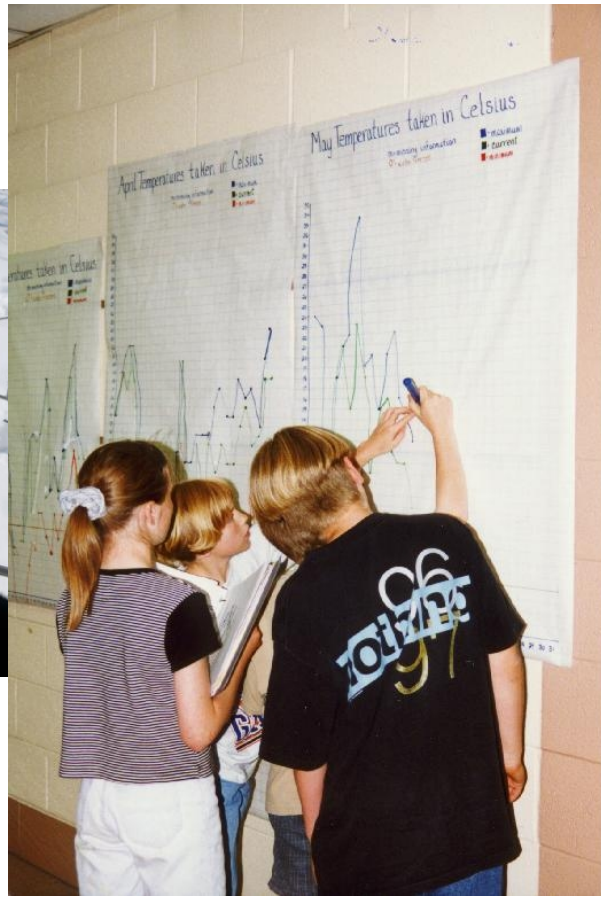
Atmosphere

….and changes that occur over time.

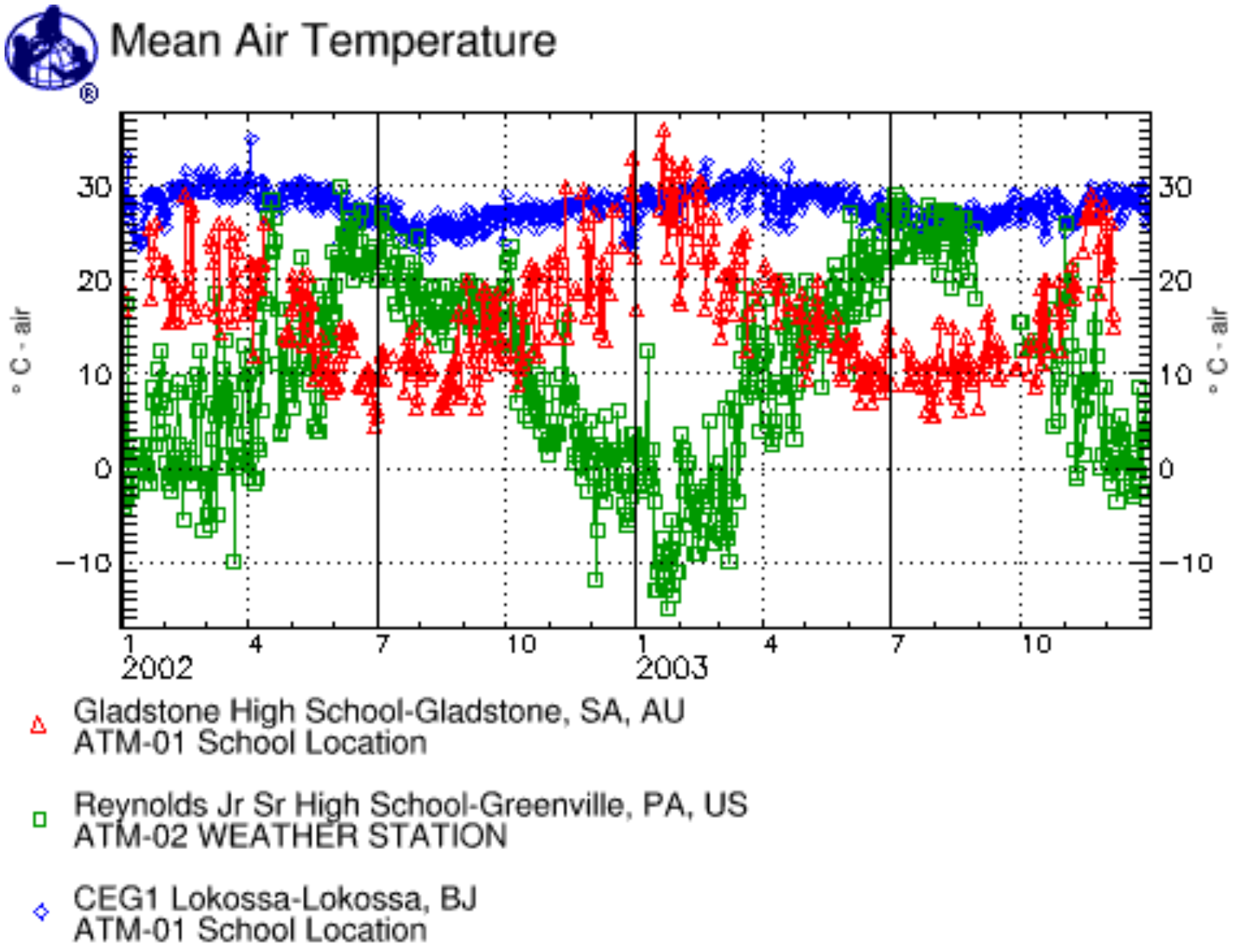
Tree growth
(carbon storage)

Green up
(phenology)

Precipitation

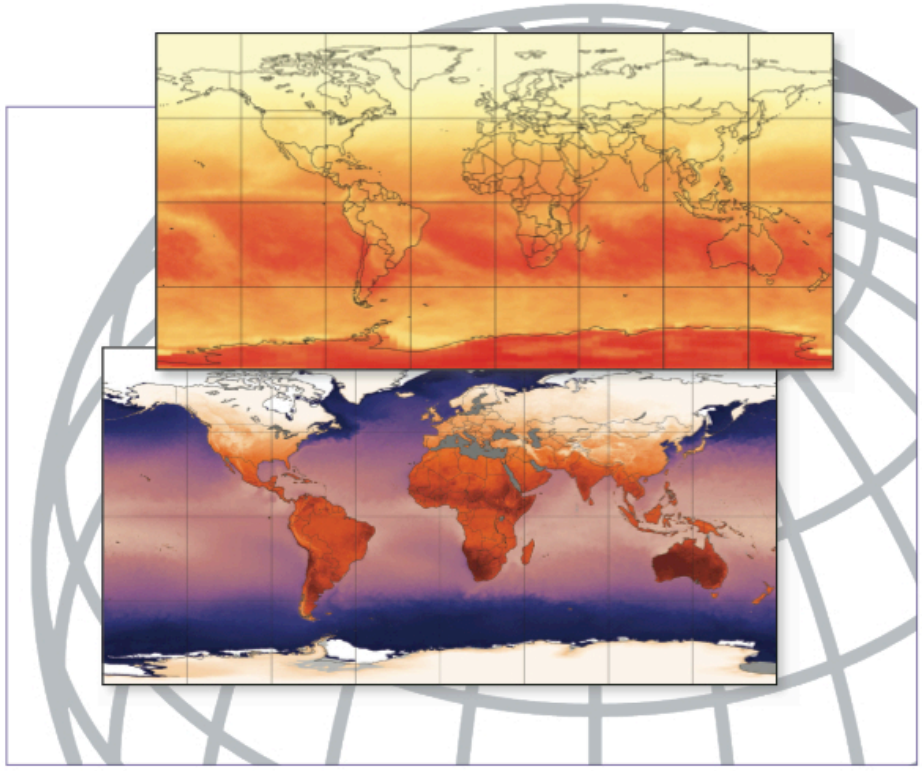


Seasonal
temperature variation



Data sets are created on demand.
This allows for a closer look at a particular year or years.

The GLOBE Earth System Poster Learning Activities

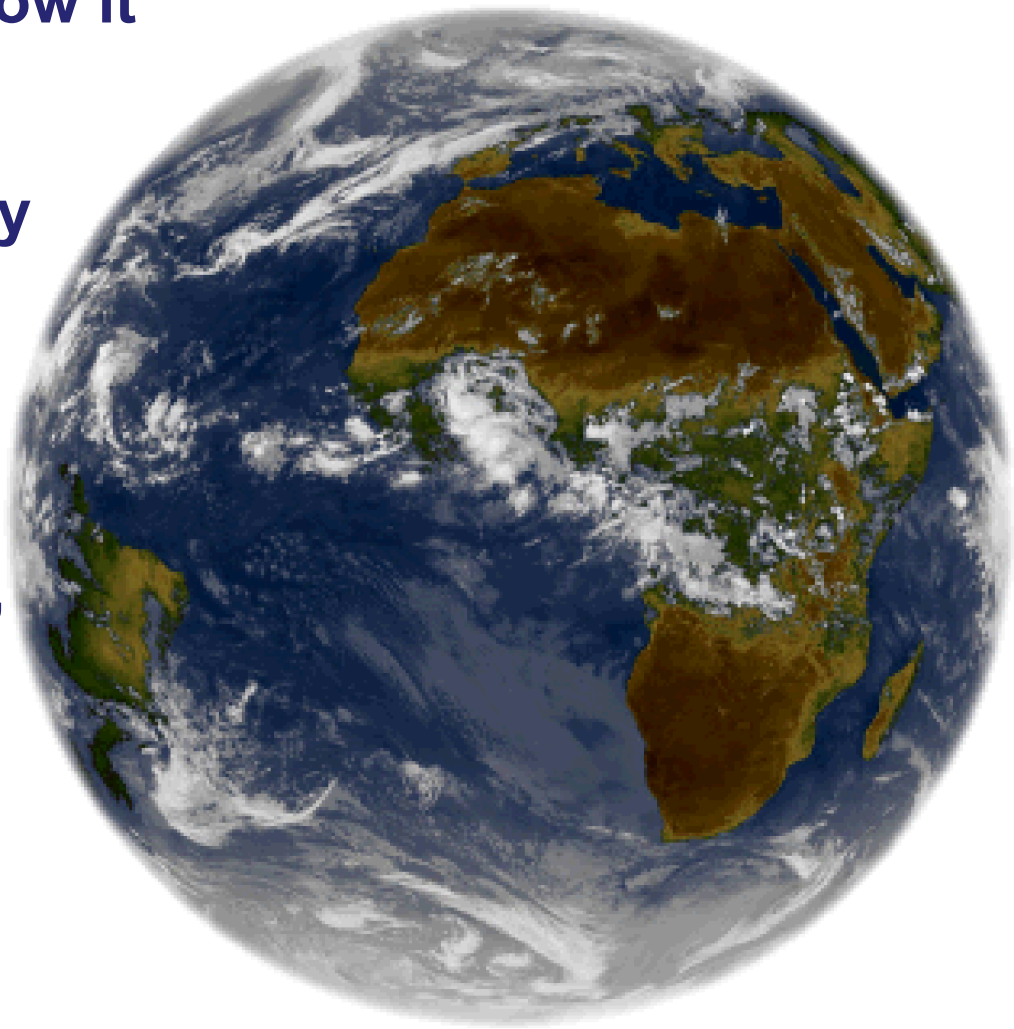


Activities to accompany the GLOBE Earth System Poster
"Exploring Connections in Year 2007"

Imagine being tasked with studying Earth and understanding how it works as a system.

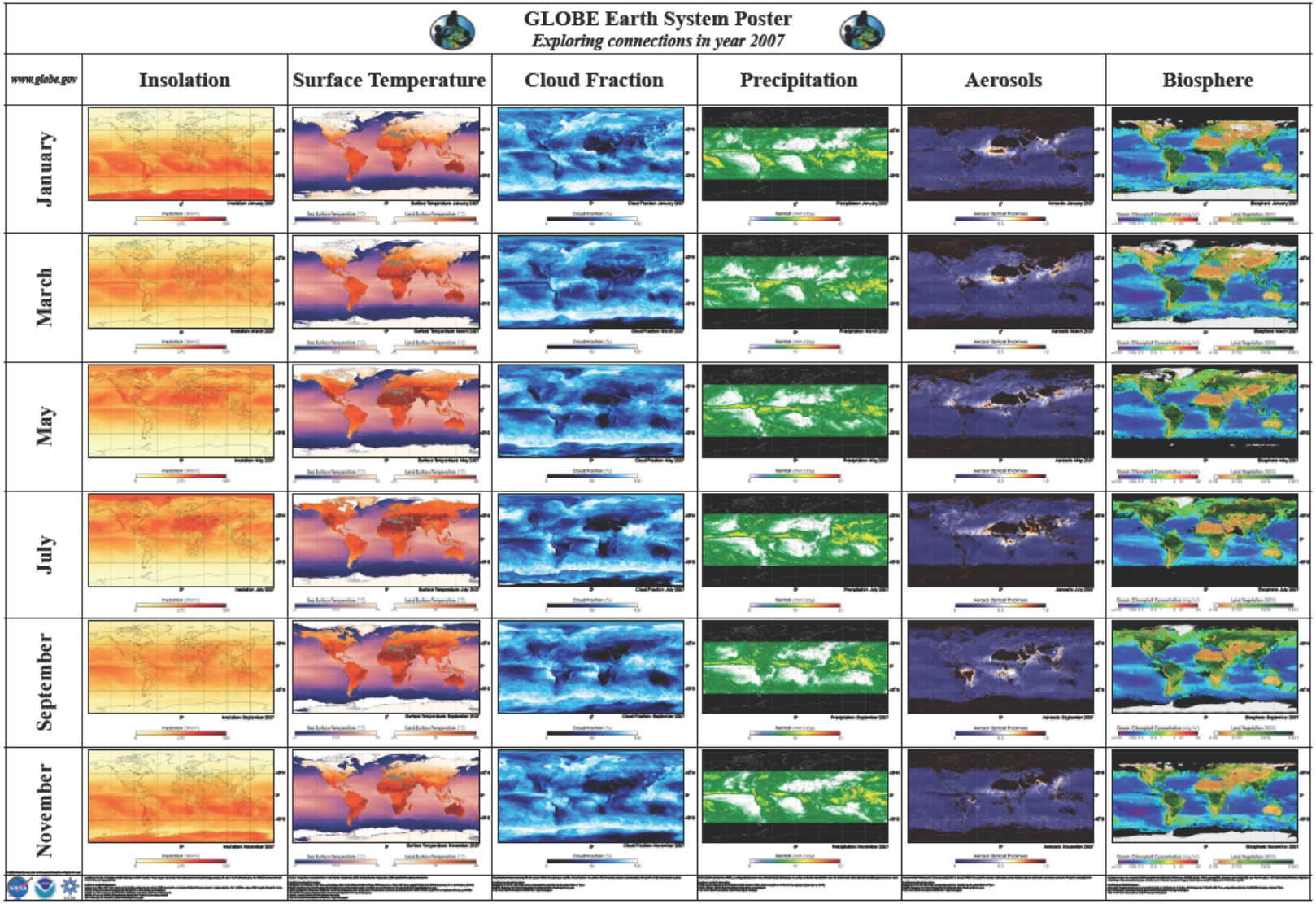
What would be the best way to undertake such an enormous task?

Scientists often study components of the system, piecing them together to gain an understanding of how various components work together.



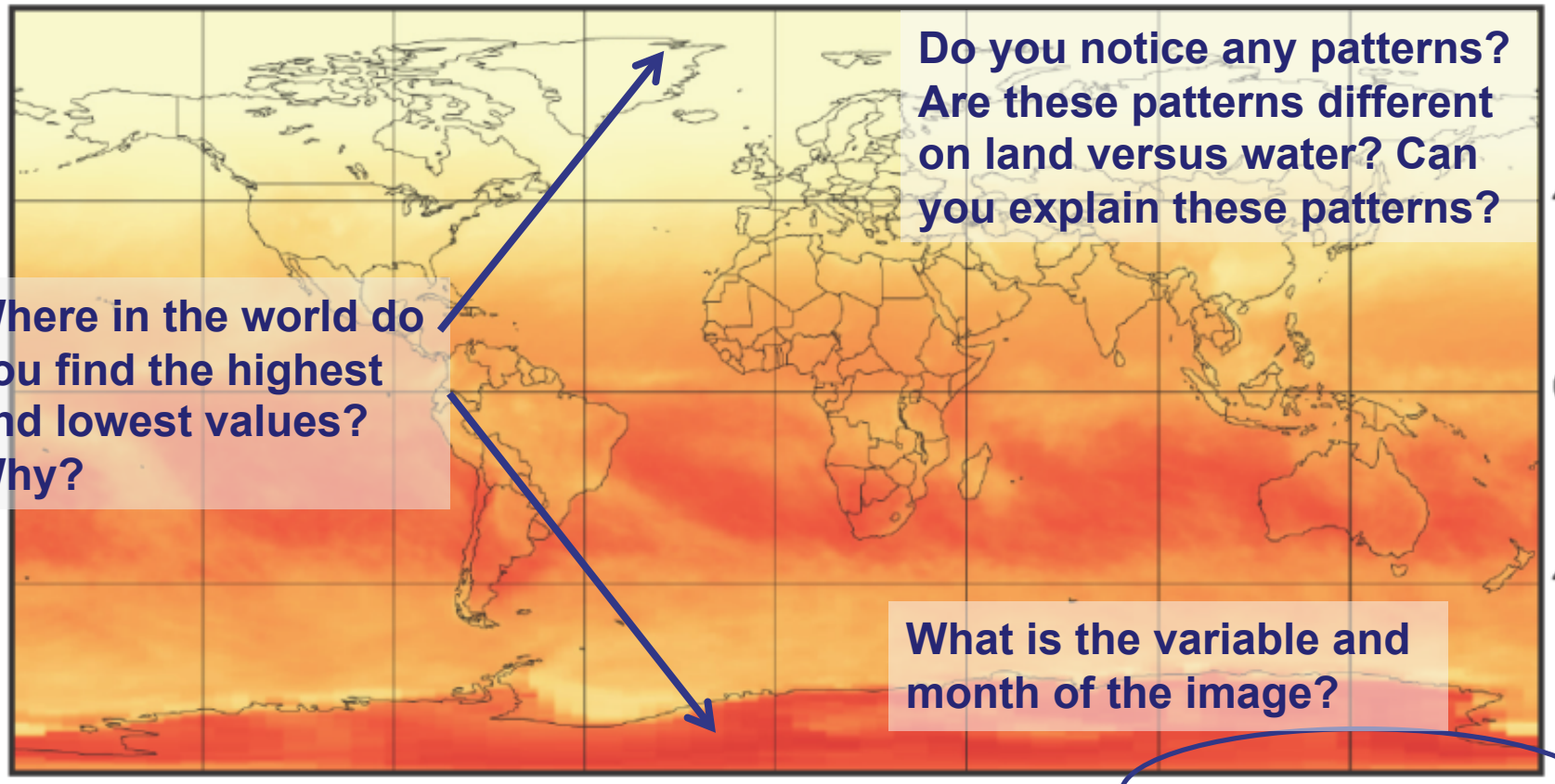
How could students take advantage of this concept to better understand Earth as a system?

The GLOBE Earth System Poster features NASA satellite imagery of the Earth

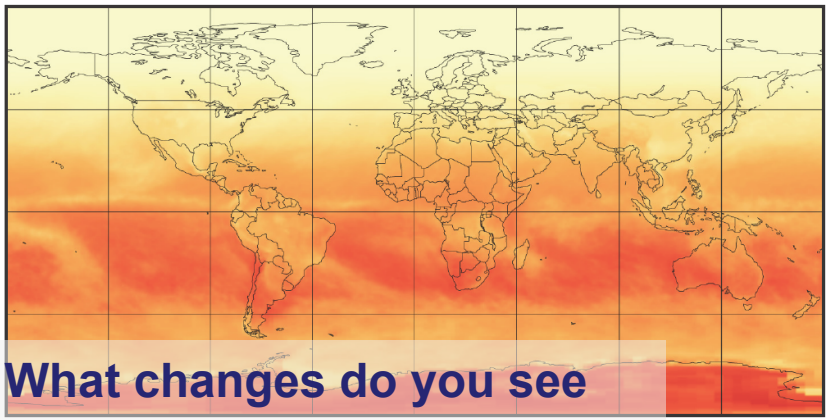


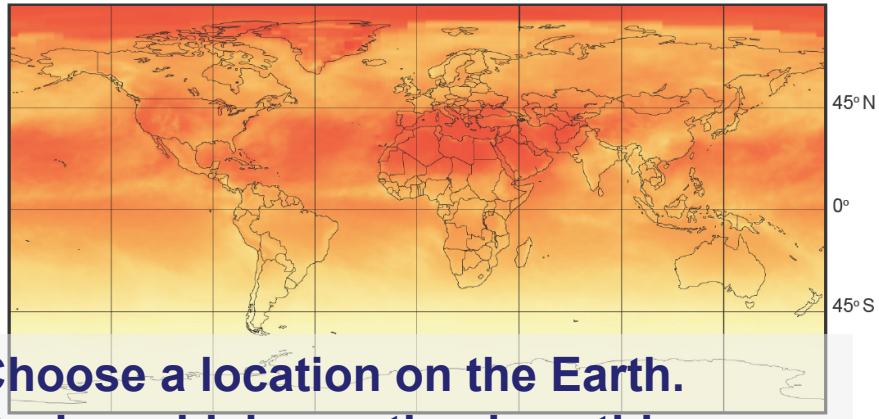
However, there is still a lot of information on this poster….

The Earth System Poster activities first guides students through an individual image by having them make simple observations



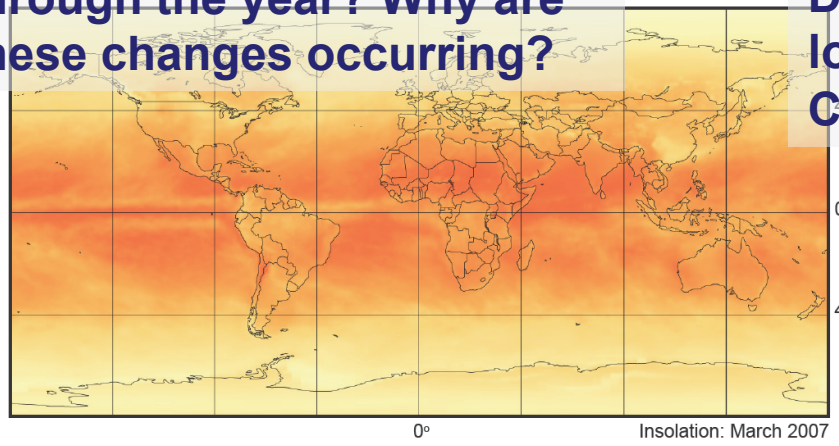
What information is available on the scale bar?

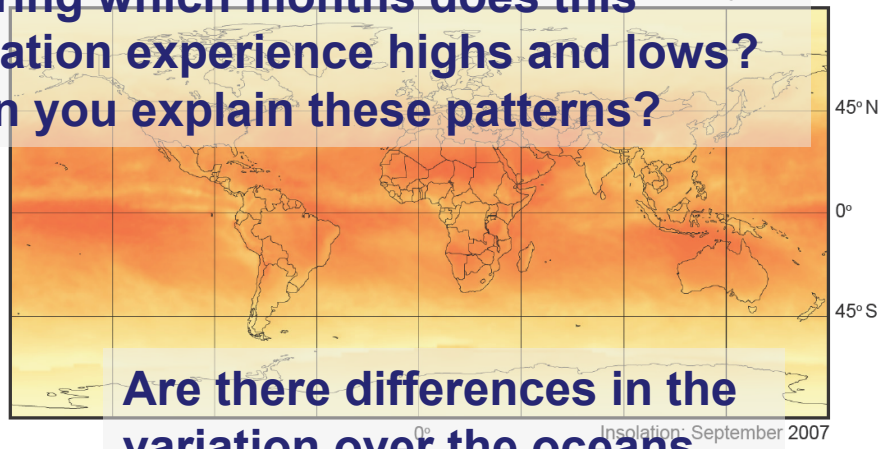




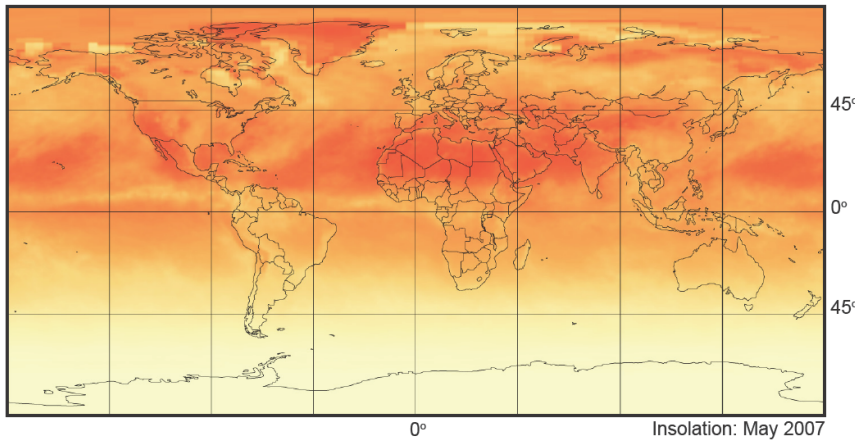
What changes do you see through the year? Why are these changes occurring?

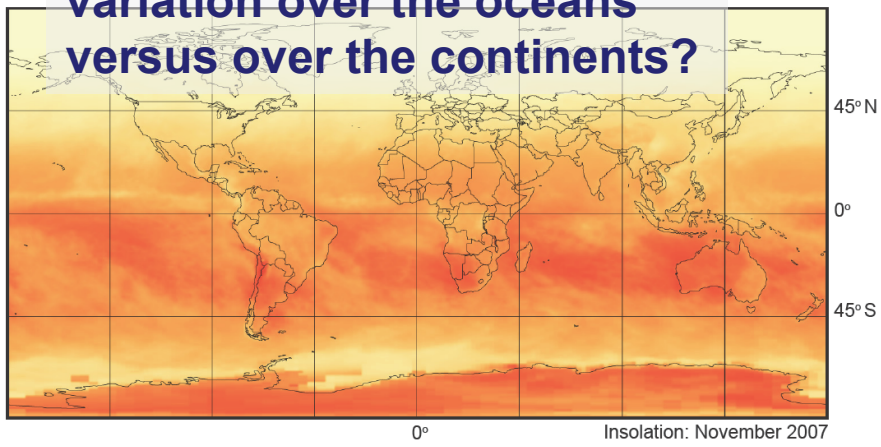
Choose a location on the Earth. During which months does this location experience highs and lows? Can you explain these patterns?

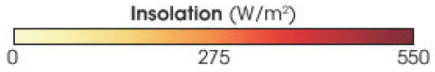


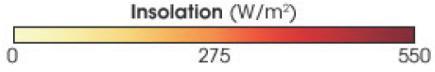


Are there differences in the variation over the oceans versus over the continents?

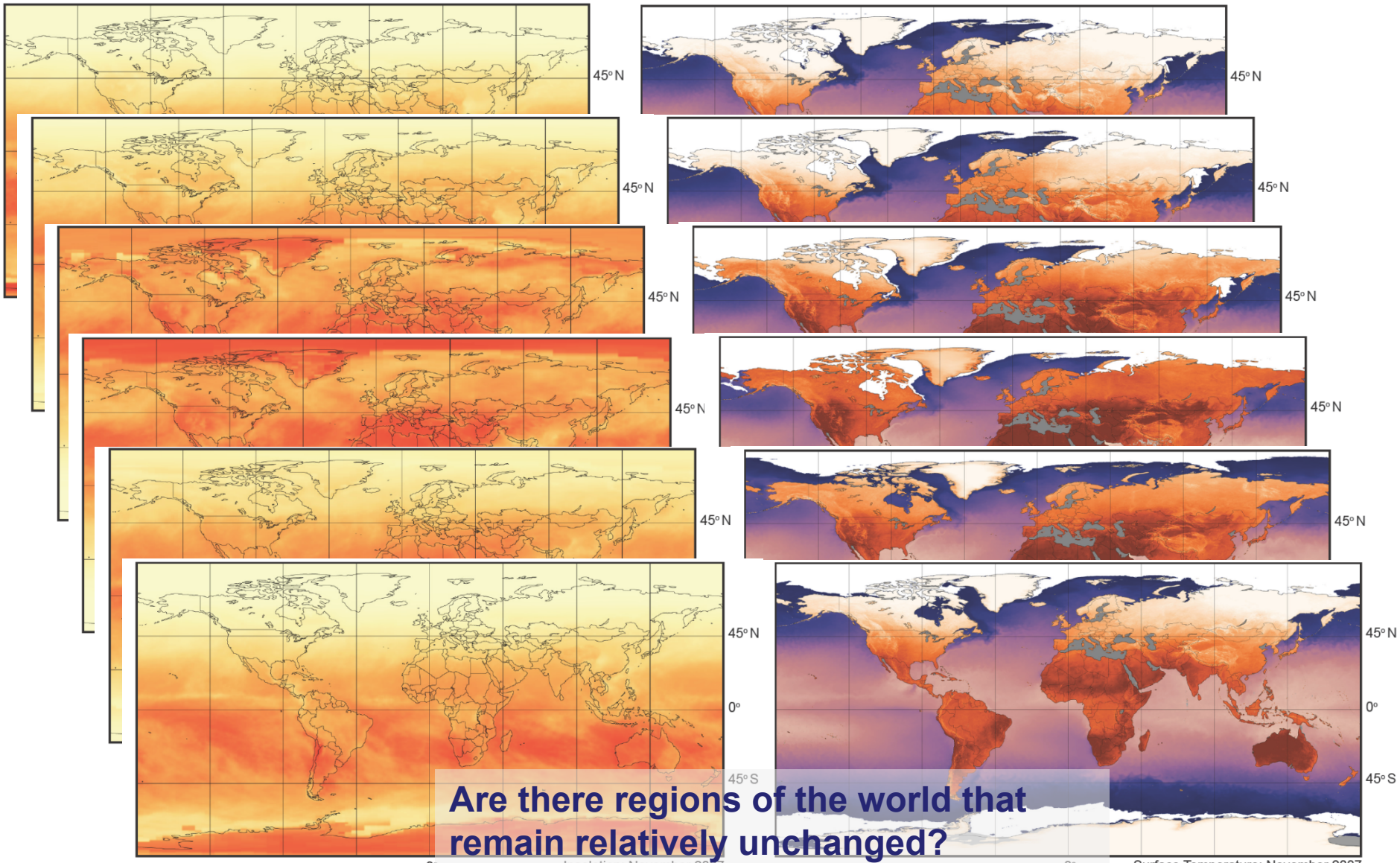






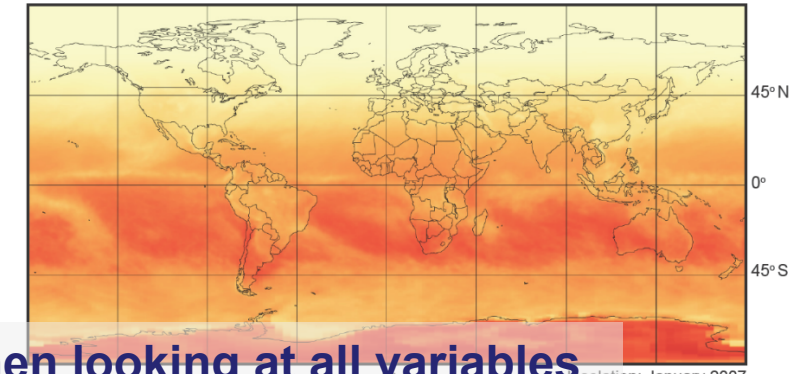


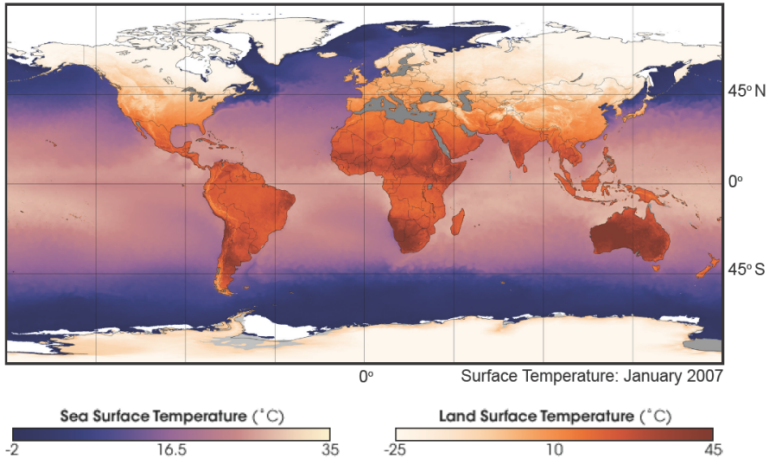
What relationships do you notice between two variables throughout the year?

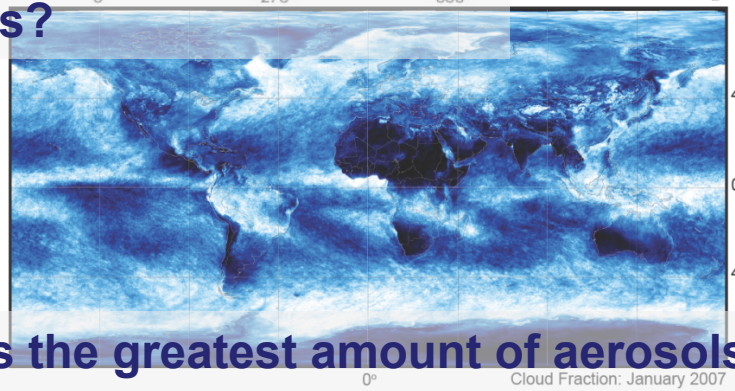


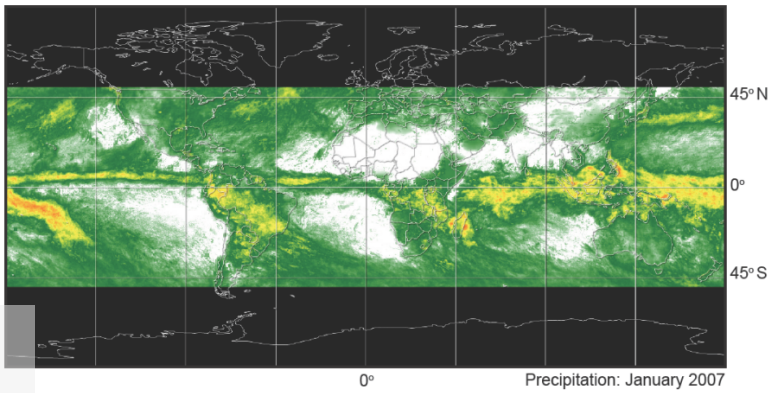
Are there regions of the world that remain relatively unchanged?

When looking at all variables for one month, where are the extremes?

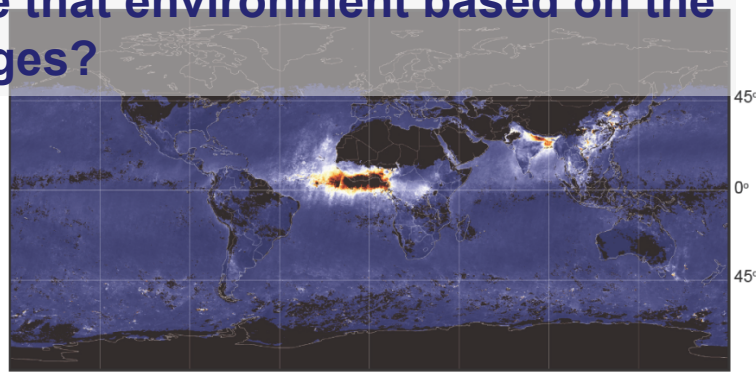


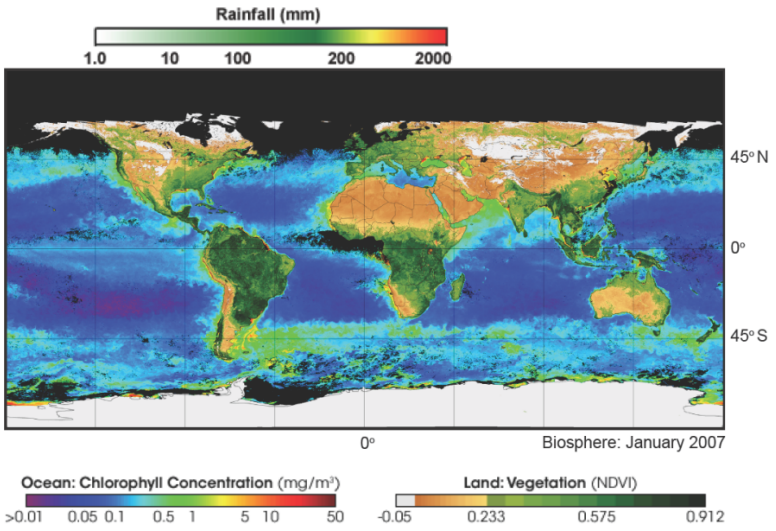




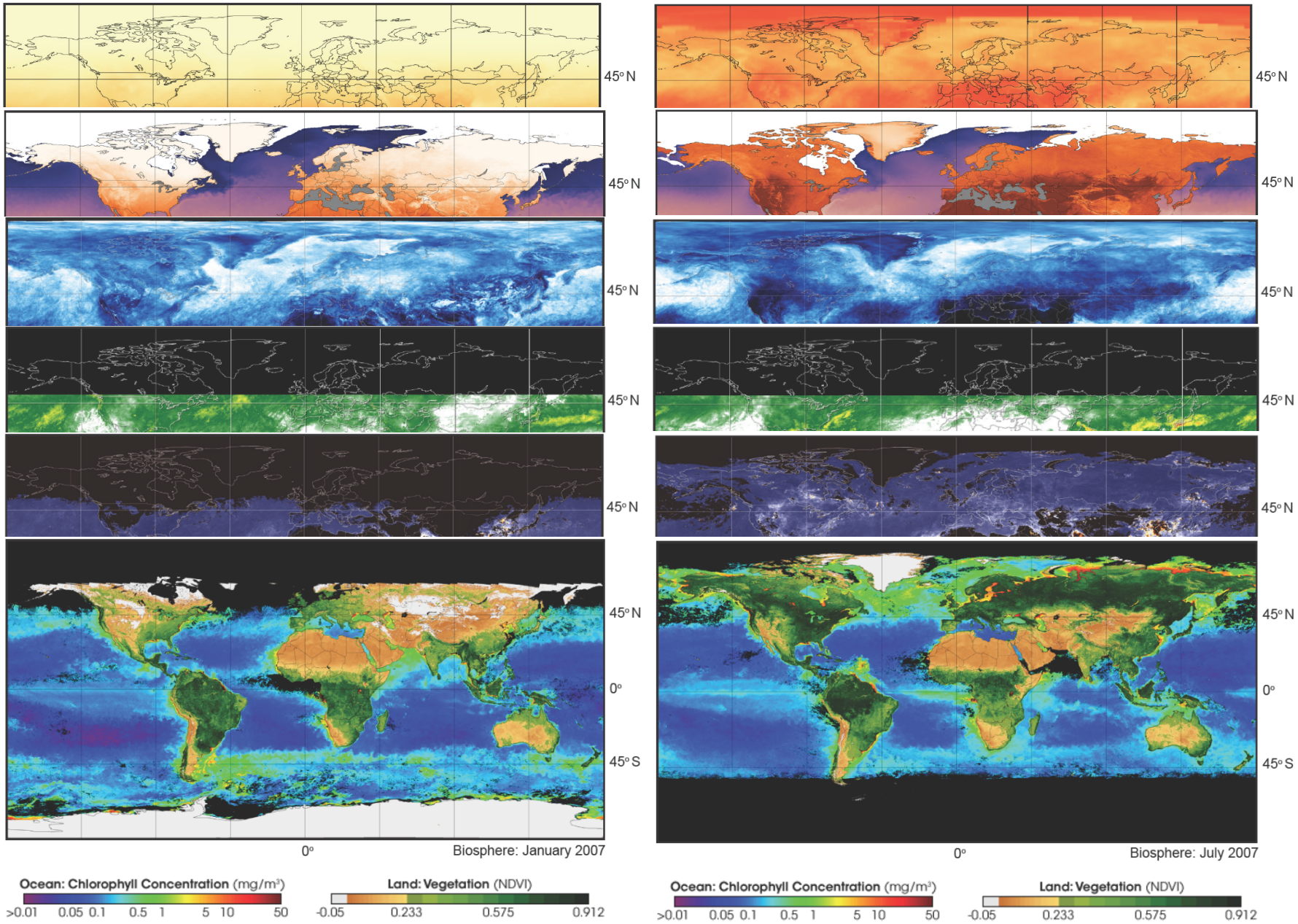


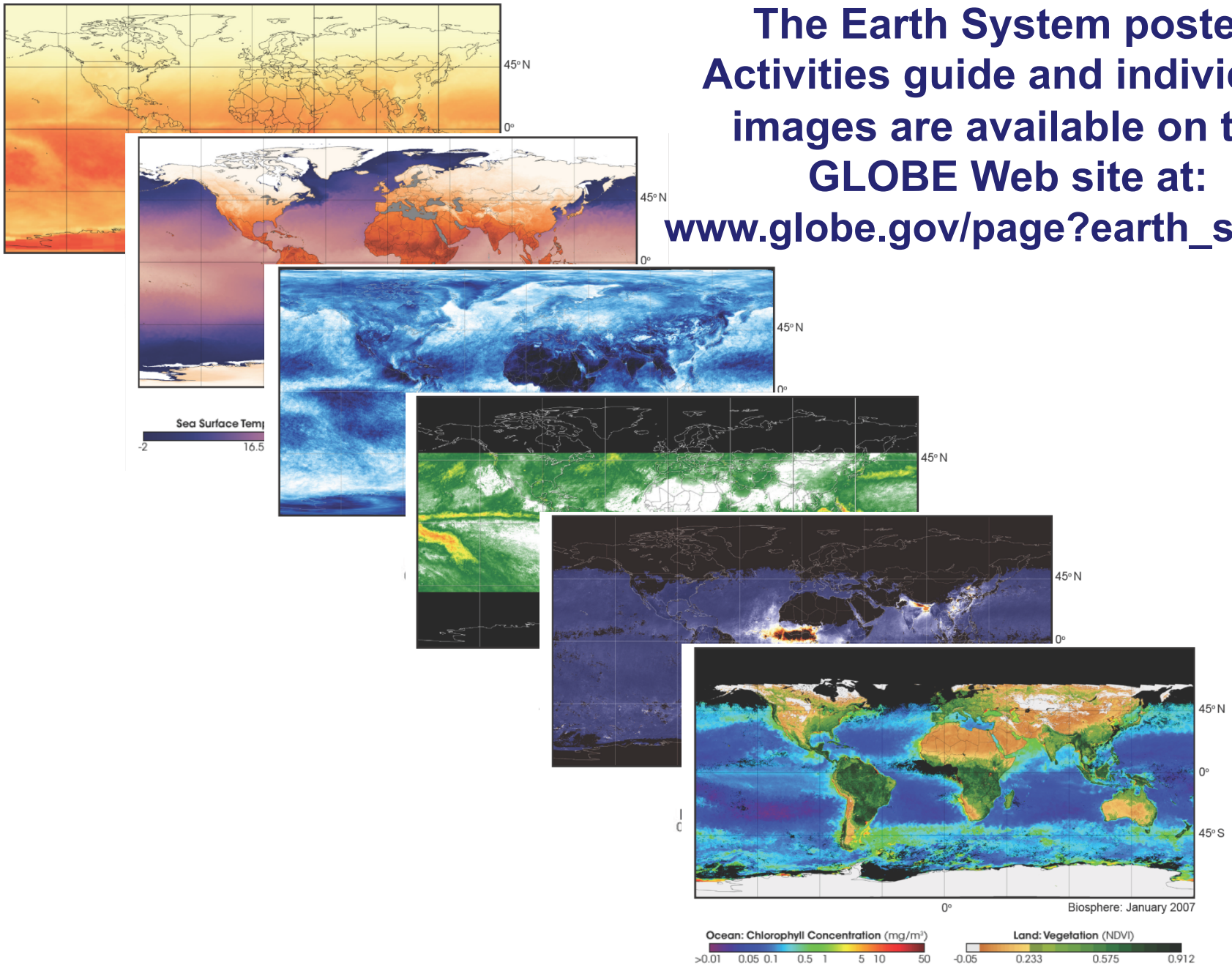
Where is the greatest amount of aerosols originating from and how would you characterize that environment based on the other 5 images?



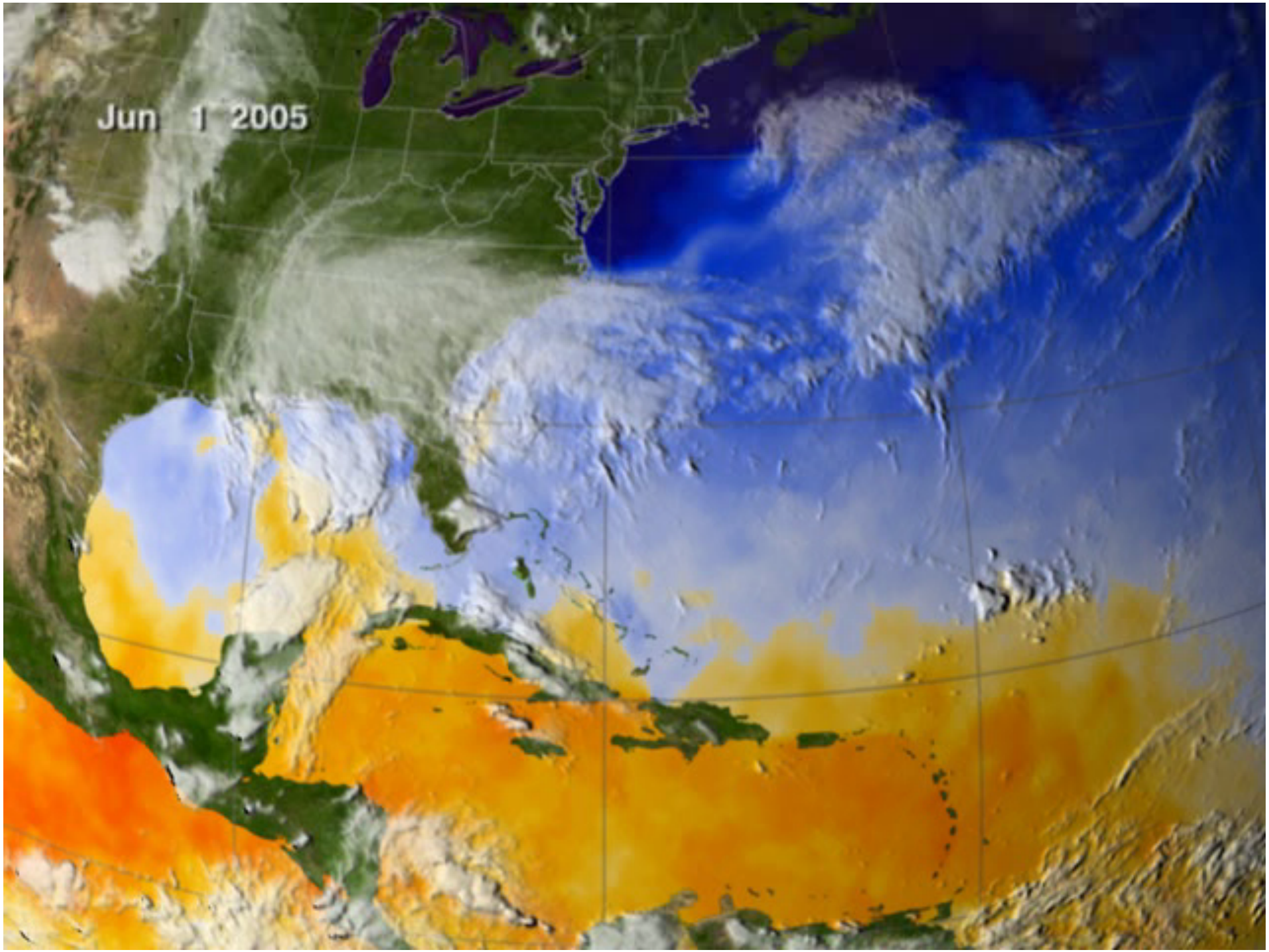


What changes do you see occurring over the six-month period? Which variable changes the most? The least? Why might this happen?





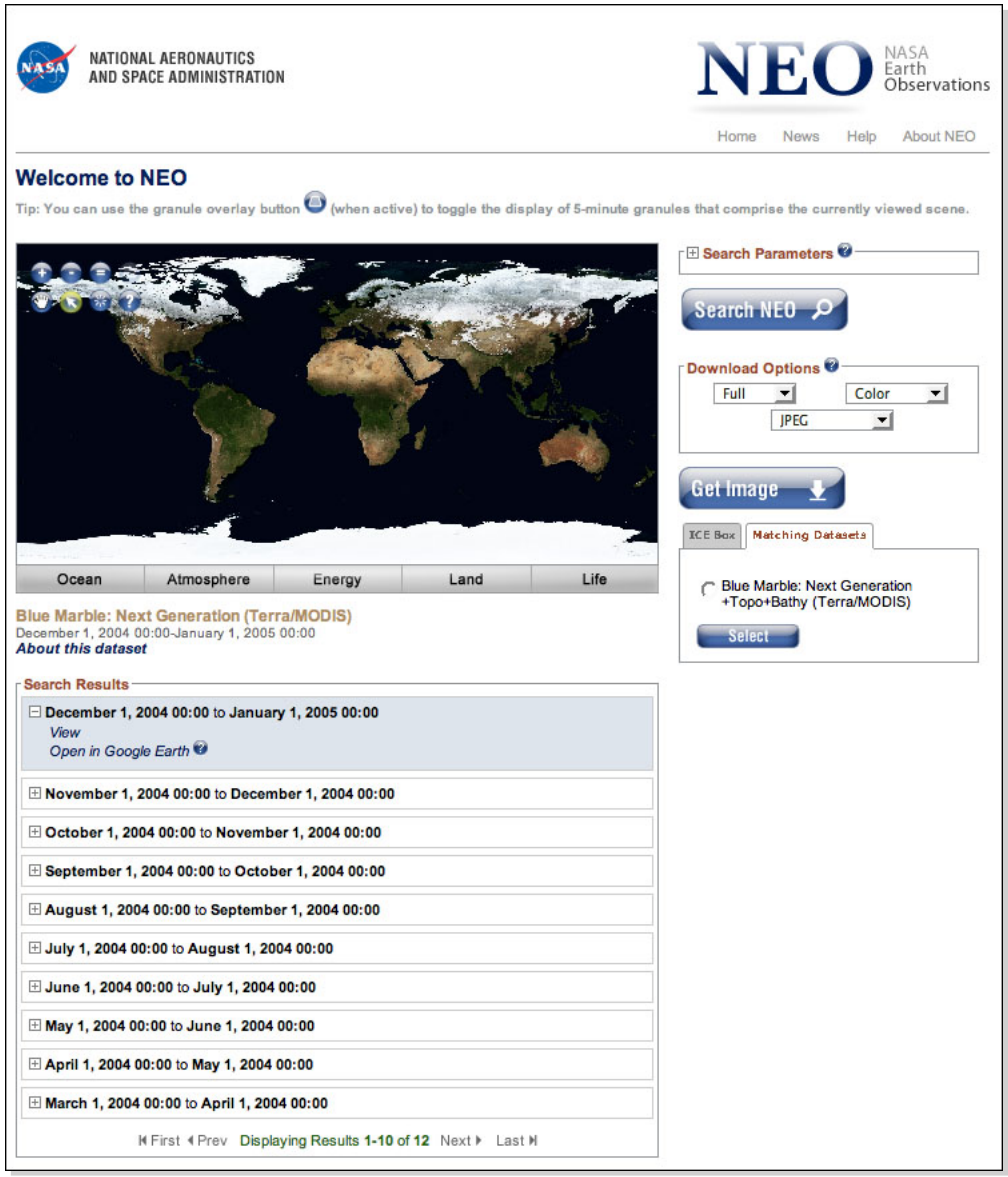
The Earth System poster, Activities guide and individual images are available on the GLOBE Web site at: www.globe.gov/page?earth_system


Jun 1 2005

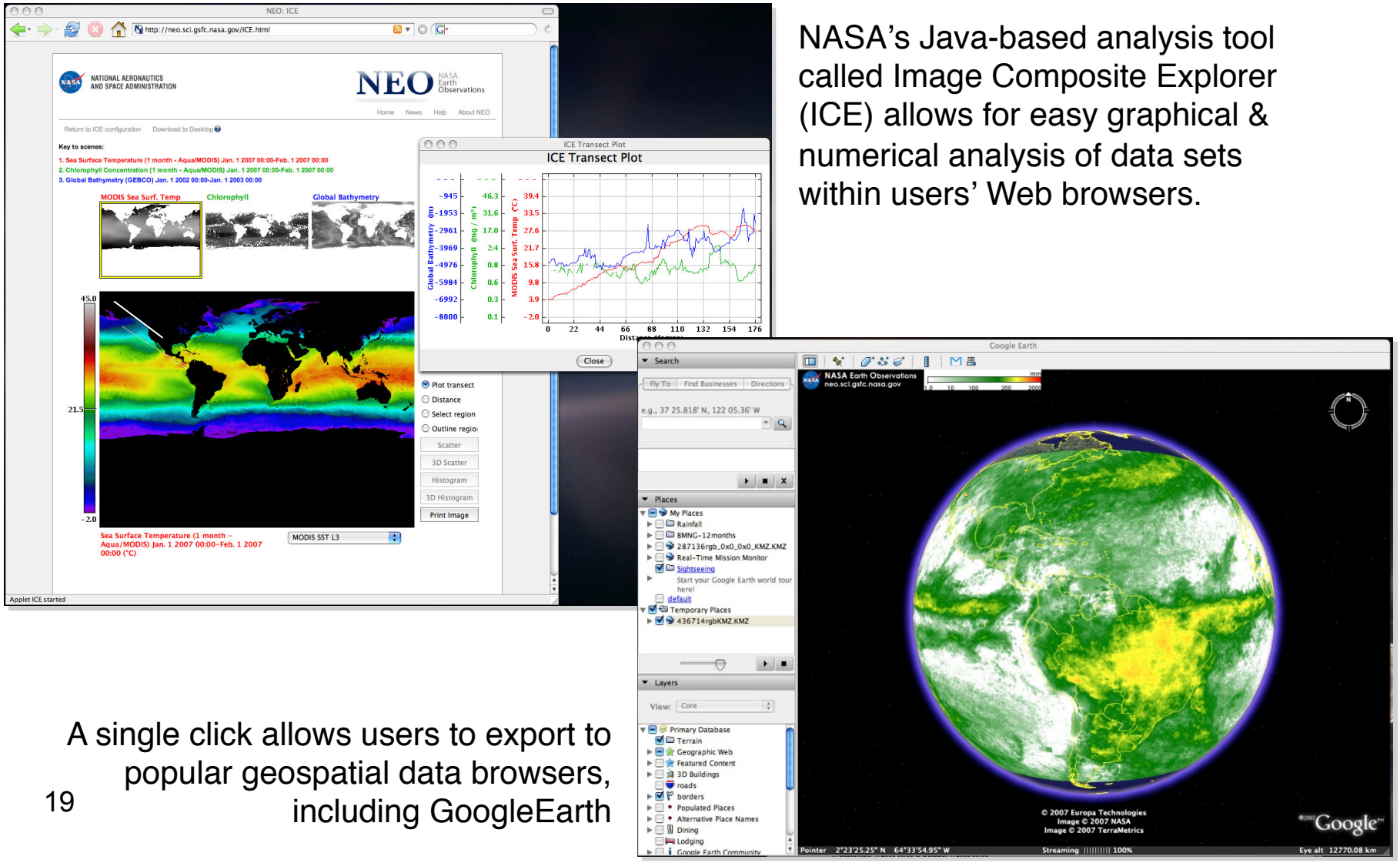
Providing data for inquiry

- **NEO** http://neo.sci.gsfc.nasa.gov

  A new Web portal designed for education & communication designers. NEO allows easy access to and export of NASA satellite remote-sensing data products into widely popular software tools (e.g., GoogleEarth, Microsoft Excel) for manipulation & analysis.



Easy export to popular tools



NASA's Java-based analysis tool called Image Composite Explorer (ICE) allows for easy graphical & numerical analysis of data sets within users' Web browsers.

A single click allows users to export to popular geospatial data browsers, including GoogleEarth

Coming Soon to a Sphere Near You!

- **In May, the poster activity will be available for "Spherical display systems.**
- **Will play on Science On a Sphere, Magic Planet, OmniGlobe, iGlobe, etc…**
- **Movie designed for science center visitors and activity for 6-12 students**

Photo credit:
Hampton University

U.S. Locations of NOAA's Science On a Sphere…

So…

- **We hope you found this activity useful!**
- **Effective for introducing the concepts of the reading maps and the connections in the complex Earth System**
- **Can be adjusted as you see fit for your audience**
- **For more information on GLOBE: Help@globe.gov**
- **To request paper copies of poster: Education@noaa.gov**
- **Thank You!**

Frank Niepold
National Oceanic and Atmospheric Administration
Climate Program Office (UCAR)
Washington, D.C., USA
frank.niepold@noaa.gov

John McLaughlin
National Oceanic and Atmospheric Administration
Office of Education
Washington, D.C., USA
john.mclaughlin@noaa.gov

Martos Hoffman
The GLOBE Program
University Corporation for Atmospheric Research (UCAR)
Boulder, CO, USA
mhoffman@globe.gov

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http://neo.sci.gsfc.nasa.gov/Search.html

NASA Science Visualization Studio

http://svs.gsfc.nasa.gov/vis/a000000/a003200/a003279/index.html